Sri Hastuti/ S951408002. 2016**. Pengaruh Perlakuan Permukaan dan Tebal Adhesif Terhadap Kekuatan Sambungan Campuran Silyl Modified Polymer - Epoksi Material Aluminium.** TESIS: Pembimbing I: Dr. Triyono, S.T., M.T. Pembimbing II: Prof. Dra. Neng Sri S., M.Sc., Ph.D. Program Studi Teknik Mesin , Program Pascasarjana, Universitas Sebelas Maret Surakarta.

ABSTRAK

Adhesive bonding merupakan teknologi sambungan yang banyak digunakan pada industri transportasi meliputi industri otomotif, aerospace dan kelautan. Tujuan penelitian ini adalah menyelidiki pengaruh perlakuan permukaan dan tebal perekat pada sambungan campuran perekat silyl modified polymer (SMP) - epoksi (EP) pada sambungan single lap joint aluminium ke aluminium. Pengujian single lap joint (SLJ) ditentukan menggunakan metode pengujian single lap shear. Kekasaran permukaan menggunakan sandpapering (SDP) dan sandblasting (SDB). Permukaan adherend mendapatkan perlakuan tanpa perlakuan kimia dan dengan perlakuan kimia etsa chromic-sulphuric acid (CSA). Variasi campuran perekat 100% EP, 75% EP : 25% SMP, 50% EP : 50% SMP, 25% EP : 75% SMP dan 100% SMP. Prosedur sambungan perekat dilakukan berdasarkan pada standar ASTM D1002. Hasil penelitian menunjukkan kekuatan sambungan maksimum pada variasi campuran perekat 75% EP : 25% SMP pada tebal perekat 0,6 mm SDP dengan perlakuan kimia etsa CSA (15,32 MPa) dan pada tebal perekat 0,2 mm SDB dengan perlakuan kimia etsa CSA (14,57 MPa). Perlakuan permukaan terhadap kekasaran SDP dan SDB dengan etsa CSA memberikan modifikasi permukaan adherend dengan porositas yang tinggi. Penambahan sedikit perekat SMP pada perekat epoksi dan perlakuan permukaan adherend meningkatkan kekuatan sambungan. Mixed perekat meningkatkan modulus elastisitas dan kekuatan mekanik sambungan. Mode kegagalan perekat yang terjadi pada sambungan SLJ 100% EP, perekat campuran SMP-EP dan 100% SMP adalah adhesif, kohesif dan mixed failure mode.

Keywords: silyl modified polymer, epoksi, aluminium, single lap joint

Sri Hastuti/ S951408002. 2016**. The Effect of Surface Treatment and Adhesive Thickness on the Joint Strength Mixed Silyl Modified Polymer - Epoxy Aluminium Material.** THESIS: Principal Advisor: Dr. Triyono, S.T., M.T. Co-advisor: Prof. Dra. Neng Sri S., M.Sc., Ph.D. Thesis: The Graduate Program in Mechanical Engineering, Sebelas Maret University, Surakarta.

ABSTRACT

Adhesive bonding is a joining technology which is used in many transportation industries including automotive, aerospace and naval industries. The objectives of this research are investigating the effect of surface treatment and adhesive thickness on the joint strength of mixed silyl modified polymer (SMP) - epoxy (EP) adhesive on single lap joint aluminium to aluminium. The single lap joint (SLJ) strength was determined by the single lap shear test method. The Roughness surface aluminium use sandpapering (SDP) and sandblasting (SDB). Surface adherend was treated without chemical treatment and with chemical treatment chromic-sulphuric acid etch (CSA). The variation of mixed adhesive are 100% EP, 75% EP : 25% SMP, 50% EP : 50% SMP, 25% EP : 75% SMP and 100% of SMP. The procedure of adhesive joints was done based on the standard of ASTM D1002. The experimental result showed that the maximum joint strength is at variation mixed adhesive 75% EP : 25% SMP at thickness adhesive 0.6 mm SDP with chemical treatment CSA etch (15.32 MPa) and at thickness adhesive 0.2 mm SDB with chemical treatment CSA etch (14.57 MPa). The surface treatments on the roughness of SDP and SDB with the chemical treatment CSA etch gives the modification on adherends surface with the high porosity. The addition of few SMP in epoxy adhesive and surface treatment adherend increases the joint strength. The mixed adhesive increases the modulus elasticity and the mechanical joint strength. The adhesive failure modes which occured in the SLJ 100% EP, mixed adhesive SMP-EP and 100% SMP are adhesive, cohesive and mixed failure mode.

Keywords: *silyl modified polymer, epoxy, aluminium, single lap joint*